

CLAIMS

What is claimed is:

1. A hydraulic braking system operated by an external force, for vehicles, in particular motor vehicles, having at least two axles, comprising
 - a low-pressure-side hydraulic reservoir (3),
 - at least one primary pressure source (2', 2'') which is operated by external energy and which is connected to the hydraulic reservoir (3) for the supply of a hydraulic medium,
 - an auxiliary pressure source (10) which is independent of said primary pressure source (2', 2'') and can be actuated by an operator and which is connected to the hydraulic reservoir (3) for the supply of hydraulic medium and the delivery side of which communicates with the hydraulic reservoir (3) in the non-actuated state of the auxiliary pressure source (10),
 - displacer assemblies (5) each being assigned to a wheel brake for independent actuation of the latter,
 - normally closed controllable inlet valves (6) which are assigned each separately to a displacer assembly (5) for the controllable connection of the latter to the primary pressure source or to one of the primary pressure sources (2', 2''),
 - normally open connecting valves (7) which are assigned each to a displacer assembly (5) and in parallel to the respective inlet valve (6) and which are connected to one another, axle by axle, on their side facing away from the assigned displacer assembly (5),

- a normally closed outlet valve (8) which is assigned each to an axle and arranged in each case between the hydraulic reservoir (3) and the interconnected sides of the connecting valves (7) of the respective axle, and
- normally open separating valves (9) which are assigned each to an axle and are arranged in each case parallel to the outlet valve (8) of the respective axle between the auxiliary pressure source (10) and the interconnected sides of the connecting valves (7) of this axle, other axles including further outlet valves (8) between the hydraulic reservoir (3) and the interconnected sides of the connecting valve (7) of these axles and further separating valves (9) being arranged between the delivery side of the auxiliary pressure source (10) and the interconnected sides of the connecting valves (7) of these axles, the outlet valves (8) forming a series connection, in which the connecting valves (7) of a second axle are connected in each case between the outlet valves of a first and of the second axle.

2. The braking system operated by an external force as claimed in claim 1, wherein the first axle is a front axle and the second axle a rear axle.

3. The braking system operated by an external force as claimed in claim 1, wherein the connecting valves (7) and the outlet valves (8) are control valves.

4. The braking system operated by an external force as claimed in claim 1, wherein all valves (6 to 9) are seat-controlled valves.

5. The braking system operated by an external force as claimed in claim 1, wherein at least part of the hydraulic

medium displaced from a displacer assembly (5) as a result of lifting play, with the wheel brakes not actuated, is conducted to the auxiliary pressure source (10) via the separating valve (9) assigned to the respective axle.

6. The braking system operated by an external force as claimed in claim 1, wherein the line path, leading to the auxiliary pressure source (10), of each displacer assembly (5) is designed as a venting path whereby air, gas and vapor bubbles travel to the auxiliary pressure source by virtue of buoyancy.

7. The braking system operated by an external force as claimed in claim 1, wherein connections between the auxiliary pressure source (10) and reservoir (3) are designed as venting paths, in such a way that air, gas and vapor bubbles travel to the reservoir by virtue of buoyancy.

8. The braking system operated by an external force as claimed in one claim 1, wherein, at the end of a braking maneuver, the outlet valves (8) are closed and the separating valves (9) opened, and, as a result of a lifting play of the displacer assemblies (5) due to the connecting valves (7) being open, with the brake not actuated, a hydraulic stream assisting a venting of the system to a system part (10), which is open to the atmosphere, can be generated.